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Device and method for checking and rotating electronic components

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**Claims**

1. A device for checking and rotating electronic components, in particular flip chips, with a pivoting part (14) attached to a pivotal point (17) for rotating the electronic components, on the exterior of which part (14) a first pickup element (19) is fixed for taking up a single electronic component from a substrate (11) and keeping hold of it during a rotational movement (15, 16; 15a) of the part (14), characterized in that a second pickup element (20) is arranged externally on the part (14) opposite the first pickup element (19) in relation to the pivotal point (17) in such a way that in each case one pickup element (19, 20) is facing the substrate (11) for each rotation (15, 16) of the part (14) through 180°, and that in the part (14) a through opening (28) is arranged between the pickup elements (19, 20) in such a way that the through opening (28) is facing the substrate (11) for a rotation (15, 16) of the pivoting part (14) through 90° or 270°.
2. Device according to Claim 1, characterized in that the first pickup element (19) is attached on a first projection (18a) and the second pickup element (20) on a second projection (18b) of the part (14).
3. Device according to Claim 2, characterized in that the through opening (28) is developed between the projections (18a, 18b) as a through channel (28) open on one long side.
4. Device according to one of the preceding claims, characterized in that on a side of the pivoting part (14) facing the substrate (11) a first optical

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facility (23) is arranged for optical checking of surfaces and correct positions of the electronic components arranged on the substrate (11) before being picked up.

- 5 5. Device according to Claim 4, characterized in that the through opening (28) is formed in such a way that it permits an optical connection between the first optical facility (23) and an electronic component arranged on the substrate (11) during a rotational movement (15, 16) of the pivoting part (14).
- 10 6. Device according to one of the preceding claims, characterized by a second optical facility (25) for checking a correct position of the rotated and deposited electronic component.
- 15 7. Method for checking and rotating electronic components, in particular flip chips, which are picked up individually from a sandwich of electronic components arranged on a substrate (11), by means of a first pickup element (19) arranged on a pivoting part (14) and are deposited in a rotated position, the pivoting part (14) being placeable between the substrate (11) and a first optical facility (23) for checking the surface and the correct position of a single component arranged on the substrate (11), characterized in that during a 180° rotation (15, 16) of the pivoting part (14) a pickup by the first pickup element (19) of a single electronic component arranged on the substrate (11), a check of a surface and the correct position of a further electronic component arranged on the substrate (11), by means of the optical facility (23) and a through opening (28) arranged in the pivoting part (14), a depositing of the electronic component held by the first pickup element (19) on a placing facility (21) after a 180° rotation (15, 16) of the pivoting part (14) and at the same time a further pickup of the further individual electronic component arranged on the substrate (11), by a second pickup element (20) arranged externally
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opposite the first pickup element (19) on the pivoting part (14), are executed.

8. Method according to Claim 7, characterized in that after the 180° rotation  
5 (15) a 180° rotation (16) going in the other direction is executed.

9. Method according to Claim 7 or 8, characterized in that by means of a second optical facility (25), a correct position of the turned and deposited component is checked and adjusted during or after its transport.

10 10. Method according to one of the claims 7 – 9, characterized in that the first optical facility (23) is activated with a predefinable time delay (37, 38) after a rotation of the through opening (28) into an optical connection line (23a) between the first optical facility (23) and the electronic component still arranged on the substrate (11).

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